

REMARKS

This is in full and timely response to the Office Action mailed November 20, 2002, submitted concurrently with a Petition for extension of time to within the first extended month. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

By the foregoing amendment, claim 1 was amended to incorporate the elements of a path for transferring the substrate between the transferring mechanism under reduced pressure and a location outside the apparatus under atmospheric pressure, and that there is at least one drying chamber. Support for this amendment can be found variously throughout the specification, for example, Fig. 1 and page 8, line 1 to page 10, line 20. Claim 12 was amended to variously correct for alleged indefiniteness. New claim 23 was added to recite that the path is connected to the first transferring port. Support for new claim 23 can be found variously throughout the specification, for example, at Fig. 1. New claim 24 was added to recite that the plurality of drying chambers are stacked vertically. Support for new claim 24 can be found variously throughout the specification, for example, at Fig. 2. New claim 25 was added to recite that the substrate processing apparatus further comprises an exhaust pipe for exhausting air from the at least one drying chamber. Support for new claim 25 can be found variously throughout the specification, for example, at Fig. 2. No prohibited new matter was added. Claims 1, 5-10, 12-18 and 23-25 are currently pending for the Examiner's reconsideration, with claims 1, 9 and 12 being independent.

Rejections under 35 U.S.C. §112

Claims 12-18 are rejected under 35 U.S.C. §112, second paragraph for indefiniteness. Applicants respectfully traverse this rejection.

The Office Action alleges that use of the term "relation to" is unclear. By using the phrases "having a relation to" and "having no relation to," Applicants are stating that there are two types of processing: processes performed using solutions such as Chemical Mechanical Polishing (CMP) and processes performed without using solutions. When processing is performed using solutions, particles and contaminated matter may adhere to the delivering and

receiving the portions and may spread the contamination when transferring other substrates. Providing two separate delivering and receiving the portions reduces the risk that the contamination will spread to substrates that go through processing without using solutions. In order to advance prosecution, Applicants have amended claim 12 to more clearly recite processed with the solution and not processed with the solution.

The office action further inquires whether the first and second chambers are separate chambers or whether there is only one chamber. Applicants respectfully submit that, as stated above, there are two separate chambers, one of performing processes using no solutions i.e. performing a vacuum type processing, and the other chamber for performing processes using solutions i.e. performing a solution type processing.

Withdrawal of all §112, second paragraph rejections is respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of U.S. Patent No. 5,303,671 to Kondo et al. Applicants respectfully traverse this rejection.

Claim 1 recites an apparatus, comprising: a polishing chamber for polishing a conductive film which is formed on a substrate; a cleaning chamber for cleaning the polished substrate polished in the polishing chamber; at least one drying chamber, having a first transferring port and a second transferring port, for drying the cleaned substrate transferred from the cleaning chamber through the first transferring port under a reduced pressure; a film forming chamber for forming a thin film on the substrate by a CVD method under the reduced pressure; a transferring mechanism for receiving the dried substrate from the drying chamber through the second transferring port and for transferring the received substrate to the film forming chamber under the reduced pressure; and a path for transferring the substrate between the transferring mechanism under reduced pressure and a location outside the apparatus under atmospheric pressure.

Claim 9 recites a method, comprising the steps of: polishing a conductive film which is formed on the substrate; cleaning and drying the polished substrate under a reduced pressure; and transferring the substrate to a position for forming a thin film by a CVD method performed under

the reduced pressure and forming the thin film at the position while maintaining the reduced-pressure state.

For the present invention recited in claim 1 and claim 9, a conductive film formed on a substrate is polished and the substrate is dried under reduced pressure after it is cleaned. The substrate is transferred to a position for forming a thin film by a CVD method and the thin film is formed at the position while maintaining the reduced-pressure state. Additionally, in claims 1 and 9, the substrate is transferred to a position for forming the thin film by the CVD method while maintaining the reduced-pressure state, which results in obtaining an original effect of being able to save energy used for reducing pressure of the area for forming the thin film by the CVD method, which neither Somekh et. al. '011 nor Kondo et al. '671 have.

Still further, the Office Action alleges that Somekh et. al. '011 discloses a reduced pressure environment at paragraph 4, lines 5-6. This is erroneous, as nowhere in the reference, particularly the referred to portions of the reference, is a reduced atmospheric pressure disclosed, taught or suggested. Rather, Somekh et. al. '011 discloses using jets to introduce air or other gas such as nitrogen into the chambers. It should be recognized that introducing a gas into a chamber is different from changing the atmospheric pressure in the chamber. Absent a description of a drop in pressure, the most that can be assumed is that there is a positive pressure increase caused by the introduction of any gas into the chamber as a result of purging. As the Office Action acknowledges that Somekh et. al. '011 does not disclose, teach or suggest a drying chamber with first and second transferring ports and a CVD chamber, so too must the Office Action acknowledge that the drying chamber does not operate at a reduced pressure.

Kondo et al. '671 does not disclose, teach or suggest operating the drying chamber with reduced pressure. Accordingly, Kondo et al. '671 does not make up for the deficiencies of Somekh et. al. '011

Accordingly, neither Somekh et. al. '011 nor Kondo et al. '671 disclose, teach or suggest a reduction in the pressure, and therefore is structurally different from the present invention. Accordingly, a prima facie case of obviousness has not been established. Withdrawal of this rejection is respectfully requested.

Claims 5-8 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of U.S. Patent No. 5,303,671 to Kondo et al., and further in view of Japanese Patent Publication No. 07-183299 to Hashimoto. Applicants respectfully traverse this rejection.

Dependent claims 5-8, being dependent upon allowable claim 1, and claims 10, being dependent upon allowable claim 9, are also allowable for the reasons above. Moreover, these claims are further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Claims 12, 13 and 16-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of U.S. Patent No. 5,303,671 to Kondo et al., and further in view of U.S. Patent 5,855,726 to Soraoka et al. Applicants respectfully traverse this rejection.

Claim 12 recites an apparatus, comprising: a first substrate carrier for transferring a substrate in an atmospheric air; a first substrate processing portion performing a vacuum type processing on the substrate; a second substrate processing portion performing a solution type processing on the substrate; a first delivering and receiving portion delivering and receiving the substrate to be processed with the solution type processing between the second substrate processing portion and the first substrate processing portion; and a second delivering and receiving portion delivering and receiving the substrate not to be processed with the solution type processing between the first substrate carrier and the first substrate processing portion.

Soraoka et al. '726 disclose two load lock chambers. however, they do not disclose or suggest "a first delivering and receiving portion delivering and receiving the substrate to be processed with the solution type processing between the second substrate processing portion and the first substrate processing portion" and "a second delivering and receiving portion delivering and receiving the substrate not to be processed with the solution type processing between the first substrate carrier and the first substrate processing portion" as recited in claim 12.

The Office Action acknowledges that Soraoka et al. '726 discloses and teaches only one

atmospheric substrate carrier. See Office Action at page 5, para. 6. The Office Action applies Soraoka et al. '726 for the proposition of a single atmospheric transfer robot and a single vacuum transfer robot. However, the load lock chambers are not the same as recited in claim 12, above, and accordingly, are not taught or suggested by Soraoka et al. '726. Still further, Soraoka et al. '726 does not make up for the deficiencies of the primary references Somekh et.al. '011 and Kondo et al. '671, either separately or in combination. Accordingly, a prima facie case of obviousness has not been established.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Referring to claim 17, the Office Action opines that having more than one carrier is a "mere duplication of parts." However, the Office Action has failed to establish a prima facie case of obviousness, as duplication of parts is only relevant when the duplication is between the same units as the reference. Withdrawal of this rejection is respectfully requested.

Dependent claims 13 and 16-18, being dependent upon allowable claim 12, are also allowable for the reasons above. Moreover, these claims are further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of U.S. Patent No. 5,303,671 to Kondo et al. and in view of U.S. Patent 5,855,726 to Soraoka et al., and further in view of U.S. Patent No. 6,153,524 to Henley et al. Applicants respectfully traverse this rejection.

Dependent claim 14, being dependent upon allowable claim 12, is also allowable for the reasons above. Moreover, this claim is further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Claim 15 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of U.S. Patent No. 5,303,671 to Kondo et al. and in view of

U.S. Patent 5,855,726 to Soraoka et al., and further in view of U.S. Patent No. 5,672,239 to DeOrnellas. Applicants respectfully traverse this rejection.

Dependent claim 15, being dependent upon allowable claim 12, is also allowable for the reasons above. Moreover, this claim is further distinguished by the additional features recited therein, particularly within the claim combination.

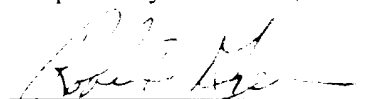
Accordingly, withdrawal of the §103 rejections is respectfully requested.

New claim 24 recites a plurality of drying chambers stacked vertically. New claim 25 recites that the substrate processing apparatus further comprises an exhaust pipe for exhausting air from the at least one drying chamber. The plurality of drying chambers, for example 40a, 40b and 40c are provided for drying the substrate. See page 9, lines 2-3. Additionally, the pressure is reduced in the drying chamber by exhausting air from the exhaust pipe 45 and drying under reduced pressure. See page 27, lines 4-6 and lines 21-24. Neither Somekh et al. '011 or Kondo et al. '671 disclose, teach or suggest actively reducing the pressure.

Conclusion

For the foregoing reasons, claims 1, 5-10, 12-18 and 23-25 are in condition for allowance. Accordingly, favorable reexamination and reconsideration of the application in light of these amendments and remarks is courteously solicited. If the examiner has any comments or suggestions that would place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number below.

Respectfully submitted,



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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 180013 for any such fees; and applicant(s) hereby petition for any needed extension of time.

Appendix I

In accordance with 37 CFR 1.121 (c)(1)(ii), amended claims 1 and 12 are set forth in a marked-up version below:

1. (twice-amended) An apparatus, comprising:
a polishing chamber for polishing a conductive film which is formed on a substrate;
a cleaning chamber for cleaning the polished substrate polished in the polishing chamber;
[a]at least one drying chamber, having a first transferring port and a second transferring port, for drying the cleaned substrate transferred from the cleaning chamber through the first transferring port under a reduced pressure;
a film forming chamber for forming a thin film on the substrate by a CVD method under the reduced pressure; [and]
a transferring mechanism for receiving the dried substrate from the drying chamber through the second transferring port and for transferring the received substrate to the film forming chamber under the reduced pressure; and
a path for transferring the substrate between the transferring mechanism under reduced pressure and a location outside the apparatus under atmospheric pressure.

12. (twice-amended) An apparatus, comprising:
a first substrate carrier for transferring a substrate in an atmospheric air;
a first substrate processing portion performing a vacuum type processing on the substrate;
a second substrate processing portion performing a solution type processing on the substrate;
a first delivering and receiving portion delivering and receiving the substrate [having a relation to]to be processed with the solution type processing between the second substrate processing portion and the first substrate processing portion; and
a second delivering and receiving portion delivering and receiving the substrate [having no relation to]not to be processed with the solution type processing between the first substrate [transferring portion]carrier and the first substrate processing portion.